

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of : Paper No: 15  
WILLIAM J. FURNAS : Art Unit: 2878  
Serial No: 09/318,249 : Examiner: T.Luu  
Filed: May 25, 1999 : Docket No: 5298-18  
For: CONTAINER INSPECTION MACHINE...: **APPEAL NO. 2003-0296**

Hon. Commissioner of Patents  
and Trademarks  
Washington, D.C. 20231

I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING  
DEPOSITED WITH THE UNITED STATES POSTAL SERVICE  
AS FIRST CLASS MAIL IN AN ENVELOPE ADDRESSED TO:  
ASSISTANT COMMISSIONER FOR PATENTS  
WASHINGTON, D.C. 20231 ON February 27, 2003

**Attention: Board of Patent Appeals  
And Interferences**

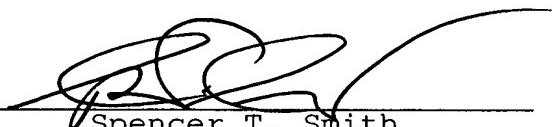
Sir:

**COMMUNICATION**

Attached hereto is a copy of a Brief on Appeal, in triplicate,  
which applicant has filed in a related case.

Respectfully submitted.

By

  
Spencer T. Smith  
Attorney for Applicants  
Reg. No. 25,926

February 27, 2003

Emhart Glass Research, Inc.  
89 Phoenix Avenue  
P.O. Box 1229  
Enfield, Connecticut 06083

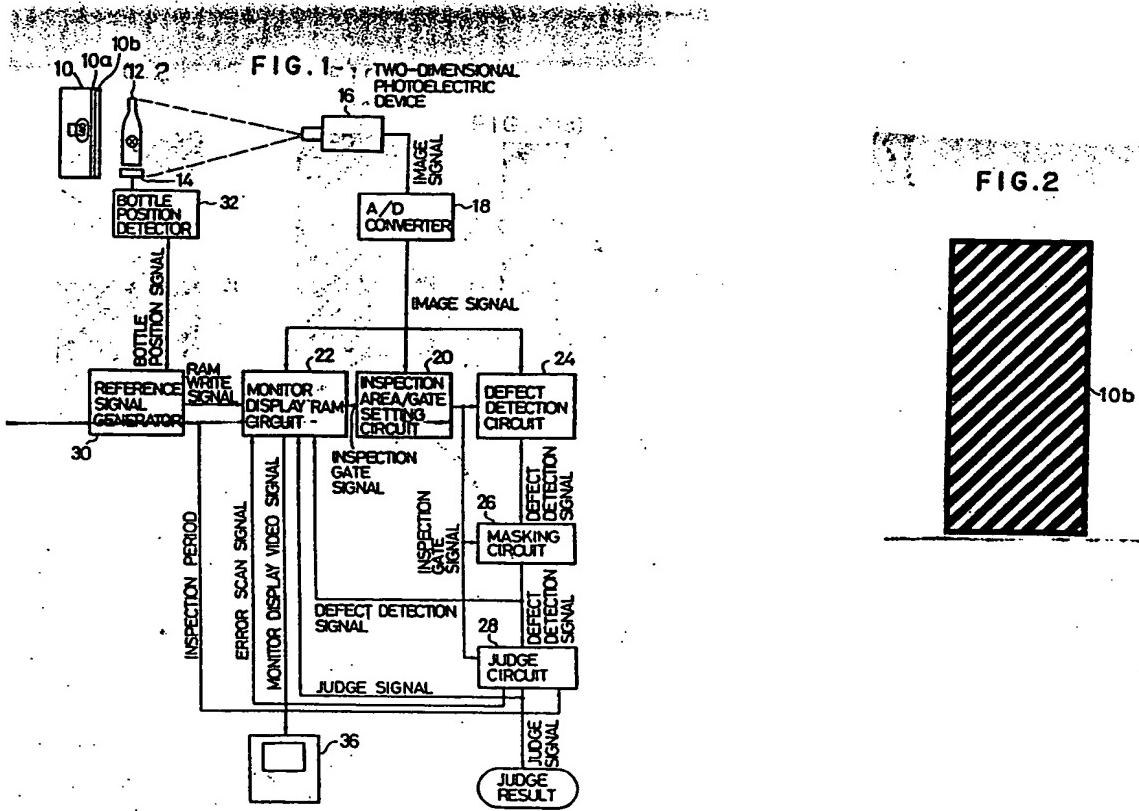
(860) 814-4052  
(860) 814-4173 (fax)

RECEIVED  
2003 MAR -5 PM 2:56  
BOARD OF PATENT APPEALS  
AND INTERFERENCES

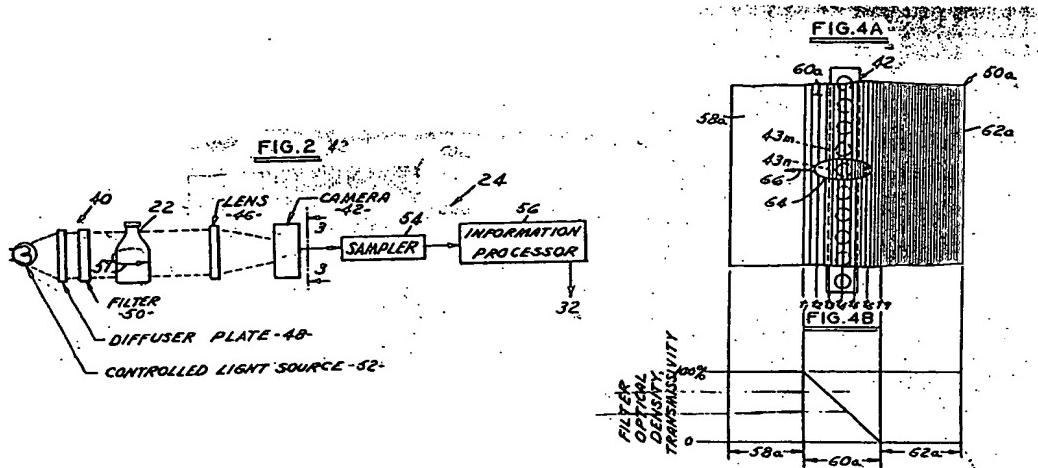
(5) Summary Of Invention

This invention concerns the identification of defects in the wall of a glass bottle. Generally, light is directed at a bottle and when a defect such as a stone, is present the light will act differently at the defect than when directed to normal glass. This difference in light action can be observed to identify the defect. One technique that has been developed is to take the light from a light source and then first direct the light through a diffusion plate to diffuse the light and then pass the diffused light through a slant slit-plate which splits the light into dark and light stripes. Cited U.S. Patent No. 5,004,909 (Fukuchi), discloses such a design in Figures 1 and 2 presented below. In Figure 1, 10 is the light source, 10a is the diffuser plate and 10b is the slant slit-plate. Figure 2 shows the slant slit-plate.

U.S. Patent Apr. 3, 1991 Sheet 3 of 9 5,004,909



A variation of this approach is to use a filter plate 50a shown in Figure 4A of U.S. Patent No. 4,601,395 (Juvinal) presented below.



The present invention does not follow this well-defined path. The inventor herein instead uses the light source itself to create the striping. The light source 16 defines a large area of light with a large number of vertical rows of L.E.D.s 18 (page 2, line 23). Individual timers 20 are connected to each vertical row of L.E.D.'s 18 so that when the rows are turned on, the timers will time out at selected times (0T, .2T, .4T, .6T, and .8T) of an imaging cycle (the time T required for the row of L.E.D.'s to turn fully on and appear white) with light intensity being a function of the time on (page 2, line 31).

#### (6) Issues

1. Is claim 1 novel over Juvinal;
2. Are claims 2-7 patentable over Juvinal;

3. Is the rejection of claims 1-7 under Section 112 proper.

(7) Grouping Of The Claims

This application only has one independent claim and all dependent claims relate to claim 1.

(8) Argument

1. Is claim 1 novel over Juvinal?

The examiner has rejected the claim 1 as anticipated by Juvinal. Juvinal discloses a light source that has a single brightness level. It is shown as a single light bulb. It is accordingly impossible for the Juvinal light source to anticipate claim 1. Claim 1 clearly provides that it is the illumination area of the light source that has a variety of intensities. Claim 1 provides for

"a light source, having an illumination area,..."

Claim 1 also provides for

"means for defining on said illumination area light intensities varying between a minimum brightness level that will permit the identification of a light blocking defect and a maximum brightness level,..."

As shown in Figure 2 of Juvinal presented above, Juvinal uses a single conventional light bulb. It has a single

intensity. Intensity levels varying between a minimum brightness level and a maximum brightness level can not be defined on that light source. Juvinall accordingly does not teach the claimed invention and the Examiner's rejection under section 102 is in error and should be reversed.

2. Are claims 2-7 patentable over Juvinall.

The prior art teaches the use of filter plate and strip plates in front of the light source to define the desired stripping. Juvinall does not teach that the light source can be manipulated to achieve these results. Juvinall teaches the use of a single light bulb. How than can claims 2-7 be obvious over Juvinall.

Claim 2 defines the light source as a plurality of rows of L.E.D.s. which per claim 1 define light source areas having different intensity levels. Juvinall teaches a single light bulb -The obvious conversion would be to an L.E.D. light source having a uniform intensity.

Claims 3-7 all define the L.E.D. source as having a variety of light intensities. Again Juvinall teaches a single light bulb.

Clearly the Examiner's rejection of claims 2-7 as obvious over Juvinall should be reversed.

3. Is the rejection of claims 1-7 under Section 112 proper.

The Examiner has rejected the claims under section 112 for the following reasons:

1. "Regarding claim 1, lines 13-14, it is unclear in its given context how a "rate of change... would be identified as a defect"?

2. "Furthermore, in lines 15-18, it is unclear how comparing neighboring pixels can exhibit a 'rate of change in brightness level.' Comparing neighboring pixels simply shows a difference or similarity in the shade or color of the pixels, not a 'rate of change'. The term 'rate of change' implies the brightness changing over time, however, simple comparison between neighboring pixels lacks the time element required for the use of the term 'rate of change.' Thus, it is unclear what applicant intends to claim."

When a defect is present light will strike the defect (a bubble, for example) and will be refracted or reflected differently than light passing through a perfect wall portion. The bubble could in effect appear black because all light hitting the bubble is directed away from its initial direction toward the camera. There is a change of intensity as the camera scans across an edge between two intensity levels. If three horizontal pixels are reviewed moving horizontally across a scan line they could go from three white, to two white and one 80% white, to one white and two 80% white, to three 80% white. This would indicate a rate of change due to the transition in intensity. If the bubble is detected the transition might go from three white to two white to black, to one white to two black to three black. This would be a rate of change in intensity higher than transitioning across an intensity change and would be seen as a fault.

The language of claim is clear.

3. "It is unclear if 'a light blocking defect' and a 'defect' refer to the same defect." The specification describes light blocking defects and refractive defects (page 5, line 8) and light blocking defect is a specific defect and defect is generic to all the defects. The language appears to be clear.

The examiner's rejection under section 112 should accordingly be reversed.

Respectfully submitted.

By

  
Spencer T. Smith  
Attorney for Applicants  
Reg. No. 25,926

September 28, 2001  
Emhart Glass Manufacturing Inc.  
89 Phoenix Avenue  
P.O.Box 1229  
Enfield, Connecticut 06083-1229  
(860) 814-4052  
(860) 81404173 (fax)

**CLAIMS**

1. A machine for inspecting the wall of a bottle comprising  
a conveyor for supporting a bottle at an inspection  
station,  
the inspection station including  
    a CCD camera on one side of the conveyor having a  
camera image,  
    a light source, having an illumination area, on the  
other side of the conveyor, for imaging the bottle on said CCD  
camera image,  
means for defining on said illumination area light  
intensities varying between a minimum brightness level that  
will permit the identification of a light blocking defect and a  
maximum brightness level, the brightness level varying  
spatially, cyclically, and continuously at a rate of change  
which is less than a rate of change that would be identified as  
a defect,  
computer means for analyzing said camera image by  
comparing neighboring pixels to determine the rate of change in  
brightness level to identify defects where the rate of change  
exceeds a defined value.
2. A machine for inspecting the wall of a bottle according to  
claim 1, wherein said light source comprises a plurality of  
L.E.D. rows.
3. A machine for inspecting the wall of a bottle according to  
claim 2, wherein said plurality of L.E.D. rows define a  
plurality of row groups each including a row having a maximum  
brightness level, a row having a minimum brightness level, at  
least one row intermediate said row having said maximum  
brightness level and said row having said minimum brightness  
level having a brightness level between said minimum brightness  
level and said maximum brightness level, and at least one row

on the side of the row having the minimum brightness level remote from said row having the maximum brightness level having a brightness level between the minimum brightness level and the maximum brightness level.

4. A machine for inspecting the profile and wall of a bottle according to claim 3, wherein there are a plurality of vertical L.E.D. rows intermediate the row having the minimum brightness level and the row having the maximum brightness level and the brightness level of said plurality of intermediate rows uniformly reduces from the row having the maximum brightness level to the row having the minimum brightness level.

5. A machine for inspecting the profile and wall of a bottle according to claim 4, wherein there are a plurality of vertical L.E.D. rows on the side of said row having the minimum brightness level remote from said row having the maximum brightness level and the brightness level of said plurality of said rows on the side of said row having the minimum brightness level remote from said row having the maximum brightness level uniformly increasing in brightness level proceeding away from the row having the minimum brightness level.

6. A machine for inspecting the profile and wall of a bottle according to claim 5, wherein the row having the minimum brightness level has a brightness level of about 20% of the maximum brightness level and wherein each of said vertical L.E.D. row groups has three vertical rows intermediate the row having the minimum brightness level and the row having the maximum brightness level, with the row adjacent the row having the minimum brightness level having a brightness level of about 40% of the maximum brightness level and the row adjacent the row having the maximum brightness level having a brightness level of about 80% of the maximum brightness level and the intermediate of the three vertical rows intermediate the row

having the minimum brightness level and the row having the maximum brightness level having a brightness level of about 60% of the maximum brightness level.

7. A machine for inspecting the profile and wall of a bottle according to claim 6, wherein each of said vertical L.E.D. row groups has three vertical rows on the side of the row having the minimum brightness level remote from the row having the maximum brightness level, with the row adjacent the row having the minimum brightness level remote from the row having the maximum brightness level having a brightness level of about 40% of the maximum brightness level and the next of the three vertical rows on the side of the row having the minimum brightness level remote from the row having the maximum brightness level having a brightness level of about 60% of the maximum brightness level and the last of the three vertical rows on the side of the row having the minimum brightness level remote from the row having the maximum brightness level having a brightness level of about 80% of the maximum brightness level.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Application of  
William J. Furnas  
Serial No: 09/318,249  
Filed: May 25, 1999  
For: CONTAINER INSPECTION MACHINE

: Paper No: 9  
: Art Unit: 2878  
: Examiner: T.Luu  
: Docket No: 5298-18

I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING  
DEPOSITED WITH THE UNITED STATES POSTAL SERVICE  
AS FIRST CLASS MAIL IN AN ENVELOPE ADDRESSED TO:  
ASSISTANT COMMISSIONER FOR PATENTS  
WASHINGTON, D.C. 20231 ON Sept. 28 2001

*Jean Diefenderfer*

Hon. Commissioner of Patents  
and Trademarks  
Washington, D.C. 20231

Sir:

BRIEF ON APPEAL

This is an Appeal Brief and it is filed in triplicate.  
Please charge Deposit Account No. 50-0696 for the \$310.00 fee  
required for filing this Brief and any additional fees.

RECEIVED  
BOARD OF APPEALS  
AND INTERFERENCES  
MAR 03 2003  
MURRAY H. DIAZ  
FEE PAID

(1) Real Party In Interest

This application has been assigned to Emhart Glass SA  
which is owned by Bucher Holding AG, CH-8166, Niederweningen,  
Switzerland.

(2) Related Appeals And Interferences

There are none.

(3) Status Of The Claims

This appeal involves claims 1-7.

(4) Status Of Amendments

No amendment has been filed following the final rejection.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Paper No: 8  
 WILLIAM J. FURNAS : Art Unit: 2621  
 Serial No: 09/318,360 : Examiner: Sheela C. Chawan  
 Filed: May 25, 1999 : Docket No: 5297-18

For: CONTAINER INSPECTION MACHINE

Hon. Commissioner of Patents  
and Trademarks  
Washington, D.C. 20231

I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING  
DEPOSITED WITH THE UNITED STATES POSTAL SERVICE  
AS FIRST CLASS MAIL IN AN ENVELOPE ADDRESSED TO:  
ASSISTANT COMMISSIONER FOR PATENTS  
WASHINGTON, D.C. 20231 ON February 27, 2003

Sir:

BRIEF ON APPEAL

This is an Appeal Brief and it is filed in triplicate. Please charge Deposit Account No. 50-0696 for the fee required for this filing (\$320.00) and the fee required for a two-month extension of time (\$410.00) extending the time for reply to February 28, 2003 and any additional fees due.

## (1) Real Party In Interest

This application has been assigned to Emhart Glass SA which is owned by Bucher Holding AG, CH-8166, Niederweningen, Switzerland.

## (2) Related Appeals and Interferences

There is a related case, Serial No. 09/318/249, filed on May 25, 1999 which is presently on appeal (Appeal No. 2003-0296). The Brief was filed September 28, 2001, a Supplemental Brief was filed on April 11, 2002 and a Board Of Patent Appeals And Interferences Docketing Notice was issued on November 21, 2002. The Appeal Brief and Supplemental Brief filed in that case is attached hereto and a copy of this Brief will be filed in that case.

RECEIVED  
BOARD OF PATENT AND TRADEMARK APPEALS  
MR. S. PITT, JR.  
APR 2 2003

### (3) Status of the Claims

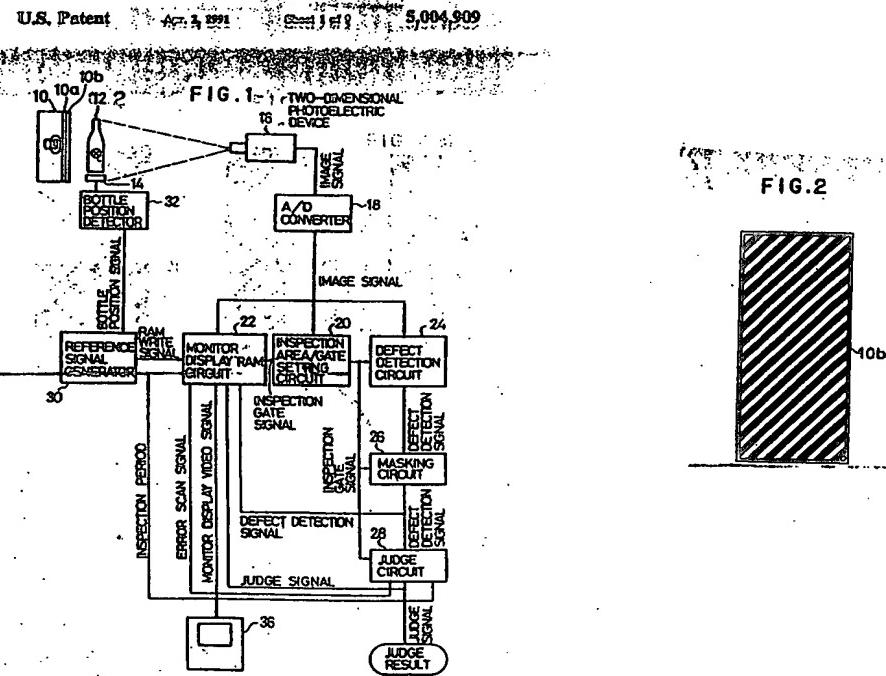
This appeal involves claim 1.

### (4) Status of Amendments

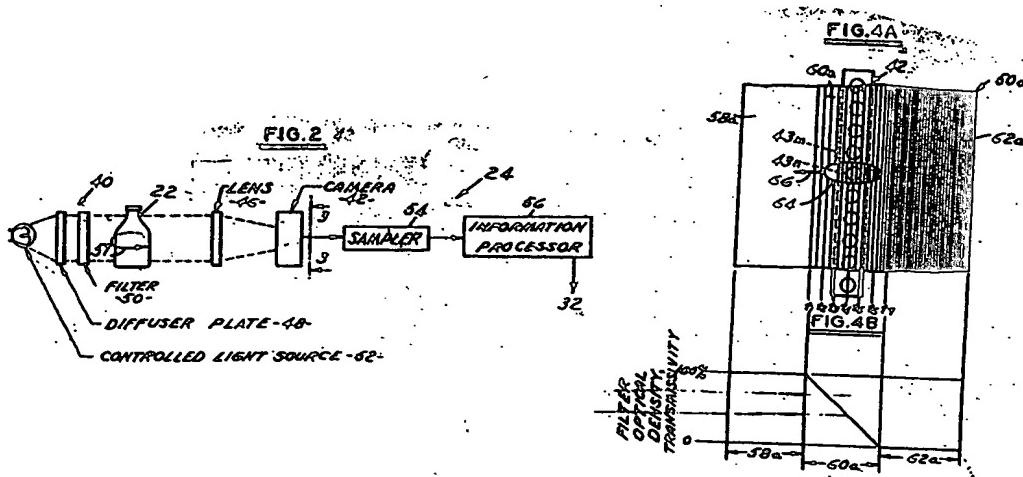
No amendment has been filed following the final rejection.

### (5) Summary of Invention

This invention concerns the identification of defects in the wall of a glass bottle. Generally, light is directed at a bottle and when a defect such as a stone, is present, the light will act differently at the defect than when directed to normal glass. This difference in light action can be observed to identify the defect. One technique that has been developed is to take the light from a light source and then first direct the light through a diffusion plate to diffuse the light and then pass the diffused light through a slant slit-plate which splits the light into dark and light stripes. Cited U.S. Patent No. 5,004,909 (Fukuchi), discloses such a design in Figures 1 and 2 presented below. In Figure 1, 10 is the light source, 10a is the diffuser plate and 10b is the slant slit-plate. Figure 2 shows the slant slit-plate.



A variation of this approach is to use a filter plate 50a shown in Figure 4A of U.S. Patent No. 4,601,395 (Juvinal) presented below.



The present invention does not follow this well-defined path. The inventor herein instead uses the light source itself to create the striping. The light source 16 defines a large area of light with a large number of vertical rows of L.E.D.s 18 (page 2, line 23). Individual timers 20 are connected to each vertical row of L.E.D.'s 18 so that when the rows are turned on, the timers will time out at selected times (0T, .2T, .4T, .6T, .8T, and T) of an imaging cycle (the time T required for the row of L.E.D.'s to turn fully on and appear white) with light intensity being a function of the time on (page 2, line 31).

#### (6) Issues

Is claim 1, patentable over Furnas in view of Trogdon.

#### (7) Grouping Of the Claims

This application only has one independent claim and all dependent claims relate to claim 1.

(8) Argument

The examiner originally rejected claim 1 as obvious over Juvinall. Applicant argued that:

"Claim 1 has been rejected as obvious over Juvinall who discloses an illumination surface having a uniform illumination throughout. The uniform intensity surface is converted into a striped pattern with the use of a filter plate. Claim 1 clearly states that the light source illumination area has various intensities per the details of the claim. Juvinall does not make obvious this invention. He leads directly away from the invention with the use of filters to define a light pattern."

The examiner withdrew the rejection and in a final office action the examiner made a new rejection that claim 1 was unpatentable over Furnas in view of Trogdon. Applicant appealed.

Furnas discloses an L.E.D. array of lights defined by vertical rows. To highlight the edges of a container so that dimensions and verticality can be checked, vertical rows are turned off proceeding from the outside in until the desired blackening of the edges of the container are highlighted. No search for defects is involved.

Claim 1 provides for

"means for defining on said illumination area light intensities varying between the extremes of black and a maximum brightness level on said light source illumination area, the intensity of the illumination varying spatially cyclically continuously at a rate of change which is less than that required to be detected as a defect;".

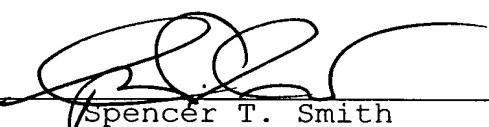
The examiner admits that Furnas does not disclose this subject matter. He states that "Furnas does not explicitly disclose varying intensities between the extremes of black and a maximum brightness level."

The examiner relies on Trogdon which combined with Furnas, he argues makes obvious claim 1. Trogdon discloses a light source 16. That is the extent of Trogdon's disclosure of his light source. The light source appears to be a light bulb. Clearly, such can not add anything to what is missing in Furnas.

The examiner's argument on Trogdon deals with how the data imaged on a CCD camera is processed and this has nothing whatever to do with the claimed invention.

The examiner's rejection is erroneous and should be reversed.

Respectfully submitted.

By   
Spencer T. Smith  
Attorney for Applicants  
Reg. No. 25,926

February 27, 2003  
Emhart Glass Research, Inc.  
89 Phoenix Avenue  
P.O.Box 1229  
Enfield, Connecticut 06083-1229  
(860) 814-4052  
(860) 814-4173 (fax)

IN THE CLAIMS

1. A machine for inspecting the wall of a bottle comprising  
a conveyor for supporting a bottle at an inspection  
station,  
the inspection station including  
a CCD camera on one side of the conveyor having a  
camera image;  
a light source, having an illumination area, on the  
other side of the conveyor, for imaging the bottle on said CCD  
camera image;  
means for defining light intensities varying between the  
extremes of black and a maximum brightness level on said light  
source illumination area, the intensity of the illumination  
varying spatially cyclically continuously at a rate of change  
which is less than that required to be detected as a defect;  
computer means for analyzing said camera image by  
comparing neighboring pixels (one or more away) alone or in  
combination to determine the rate of change in intensity to  
identify defects where the rate of change exceeds a defined  
value.
2. A machine for inspecting the wall of a bottle according to  
claim 1, wherein said light source comprises a plurality of  
L.E.D. rows.
3. A machine for inspecting the wall of a bottle according to  
claim 2, wherein said plurality of L.E.D. rows define a  
plurality of row groups each including a row having a maximum  
intensity at one side, a black row, at least one row  
intermediate said row having said maximum intensity and said  
black row having an intensity between black and said maximum

intensity, and at least one row on the side of said black row remote from said row having said maximum intensity having an intensity between black and said maximum intensity.

4. A machine for inspecting the profile and wall of a bottle according to claim 3, wherein there are a plurality of vertical L.E.D. rows intermediate the black row and the row having the maximum intensity and the intensity of said plurality of intermediate rows uniformly reduces from the maximum intensity to black.

5. A machine for inspecting the profile and wall of a bottle according to claim 4, wherein there are a plurality of vertical L.E.D. rows on the side of said black row remote from said row having maximum intensity and the intensity of said plurality of said rows on the side of said black row remote from said row having said maximum intensity uniformly increase in intensity proceeding away from the black row.

6. A machine for inspecting the profile and wall of a bottle according to claim 5, wherein each of said vertical L.E.D. row groups has three vertical rows intermediate said black and white rows, with the intensity of the row adjacent the black row having an intensity of about 25% of the intensity of the row having the maximum intensity and the intensity of the row adjacent the row having the maximum intensity having an intensity of about 75% of the maximum intensity and the intensity of the intermediate of the three vertical rows intermediate the black row and the row having the maximum intensity having an intensity of about 50% of the maximum intensity.

7. A machine for inspecting the profile and wall of a bottle according to claim 6, wherein each of said vertical L.E.D. row groups has three vertical rows on the side of said black row remote from said row having the maximum intensity, with the intensity of the row adjacent the black row having an intensity of about 25% of the maximum intensity and the intensity of the next row having an intensity of about 50% of the maximum intensity and the intensity of the last of the three vertical rows remote from the black row having an intensity of about 75% of the maximum intensity.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

~~TRADE MARK~~ Application of

: Paper No: 12

WILLIAM J. FURNAS

: Art Unit: 2878

Serial No: 09/318,249

: Examiner: T.Luu

Filed: May 25, 1999

: Docket No: 5298-18

For: CONTAINER INSPECTION MACHINE...

Hon. Commissioner of Patents  
and Trademarks  
Washington, D.C. 20231

I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING  
DEPOSITED WITH THE UNITED STATES POSTAL SERVICE  
AS FIRST CLASS MAIL IN AN ENVELOPE ADDRESSED TO:  
ASSISTANT COMMISSIONER FOR PATENTS  
WASHINGTON, D.C. 20231-0000

Sir:

**SUPPLEMENTAL BRIEF ON APPEAL**

This is a Supplemental Appeal Brief and it is filed in triplicate. Please charge Deposit Account No. 50-0696 the \$110.00 fee required for a one month extension of time required for the filing of this Supplemental Appeal Brief AND <sup>AN</sup> ~~AND~~ <sup>703</sup> ~~703~~ <sup>AND</sup> ~~AND~~ <sup>DE</sup> ~~DE~~ <sup>M</sup> ~~M~~ additional fee.

(6A) Supplemental Issue

1. Is claim 1 novel over Juvinal U.S. Pat. No. 4,601,395.

RECEIVED  
NOV 20 2003 MAR 13 AM 10:01  
REG'D OF PATENT APPEALS  
AND INTERFERENCES

## (7) Grouping Of The Claims

This application only has one independent claim and all dependent claims relate to claim 1.

## (8) Argument

1. Is claim 1 novel over Juvinall

The examiner has rejected the claim 1 as anticipated by Juvinall. Juvinall discloses a light source that has a single brightness level. It is shown as a single light bulb. It is

accordingly impossible for the Juvinal light source to anticipate claim 1. Claim 1 clearly provides that it is the illumination area of the light source that has a variety of intensities. Claim 1 provides for

"a light source, having an illumination area,..."

Claim 1 also provides for

"means for defining on said illumination area light intensities varying between a minimum brightness level that will permit the identification of a light blocking defect and a maximum brightness level,..."

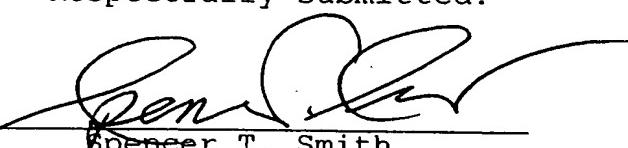
As shown in Figure 2 of Juvinal presented above, Juvinal uses a single conventional light bulb. It has a single intensity. Intensity levels varying between a minimum brightness level and a maximum brightness level can not be defined on that light source. Juvinal accordingly does not teach the claimed invention and the Examiner's rejection under section 102 is in error and should be reversed.

Juvinal discloses a filter which receives the light from the illumination device and defines a light pattern having varying intensities on the filter. That is the prior art. The examiner erroneously argues that this filter defines these light variations on the light source. To the contrary, Juvinal defines these light variations on the filter. There is no light variation on the light source in Juvinal. The claimed

invention requires that the variation in intensities be created "on said illumination area". Juvinall does not do this and the section 102 rejection is erroneous.

Respectfully submitted.

By



Spencer T. Smith  
Attorney for Applicants  
Reg. No. 25,926

April 3, 2002

Emhart Glass Research, Inc.  
89 Phoenix Avenue  
P.O.Box 1229  
Enfield, Connecticut 06083

(860) 814-4052  
(860) 814-4173 (fax)

AF 2800  
d1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

The Application of  
William J. Furnas  
Serial No: 09/318,249  
Filed: May 25, 1999  
For: CONTAINER INSPECTION MACHINE

: Paper No: 9  
: Art Unit: 2878  
: Examiner: T.Luu  
: Docket No: 5298-18

I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING  
DEPOSITED WITH THE UNITED STATES POSTAL SERVICE  
AS FIRST CLASS MAIL IN AN ENVELOPE ADDRESSED TO:  
ASSISTANT COMMISSIONER FOR PATENTS  
WASHINGTON, D.C. 20231 ON Sept. 28, 2001

*Jean Dianfield*

Hon. Commissioner of Patents  
and Trademarks  
Washington, D.C. 20231

Sir:

BRIEF ON APPEAL

This is an Appeal Brief and it is filed in the ~~application~~ <sup>2003 MAR 13 AM 1000</sup>.  
Please charge Deposit Account No. 50-0696 for the ~~\$310.00~~ <sup>\$310.00</sup> fee  
required for filing this Brief and any additional fee due..

(1) Real Party In Interest

This application has been assigned to Emhart Glass SA  
which is owned by Bucher Holding AG, CH-8166, Niederweningen,  
Switzerland.

(2) Related Appeals And Interferences

There are none.

(3) Status Of The Claims

This appeal involves claims 1-7.

(4) Status Of Amendments

No amendment has been filed following the final rejection.

03/07/2003 SZEWDIE1 00000045 500696 09318249

01 FC:1402 320.00 CH

RECEIVED

2003 MAR 13 AM 1000

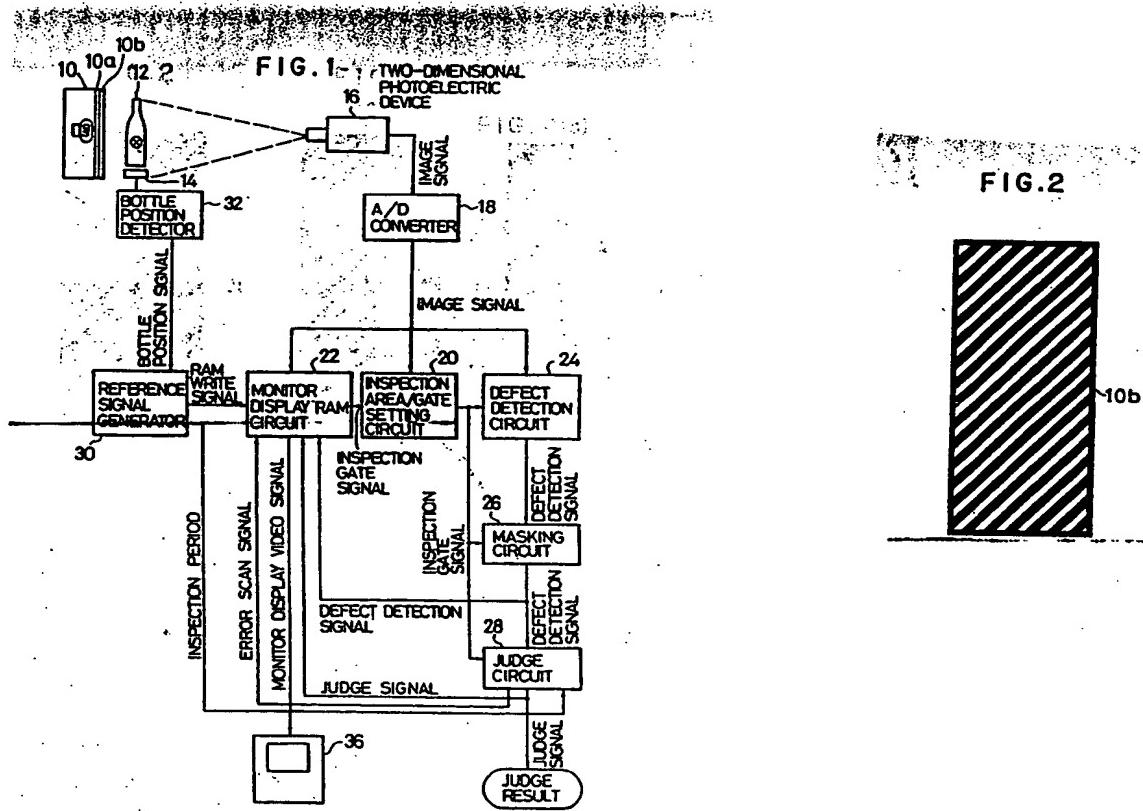
MAR 11 2003

TECHNOLOGY CENTER 2800

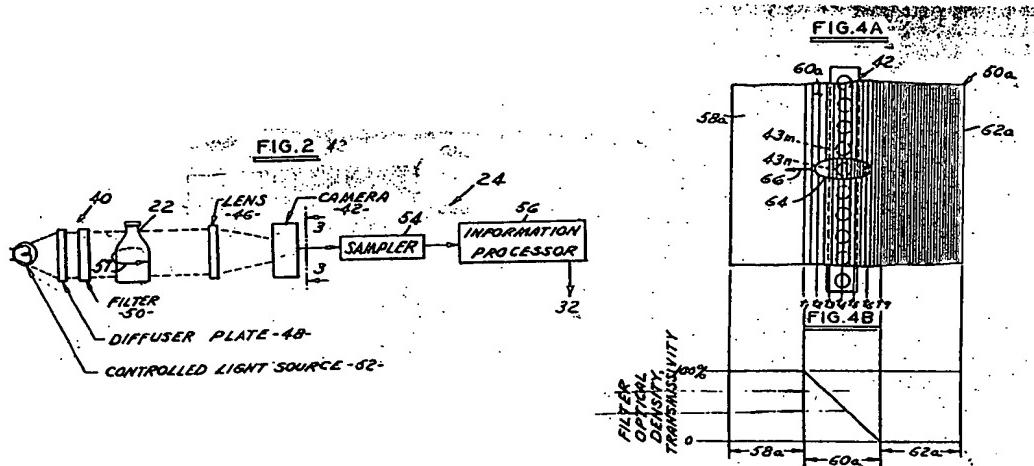
(5) Summary Of Invention

This invention concerns the identification of defects in the wall of a glass bottle. Generally, light is directed at a bottle and when a defect such as a stone, is present the light will act differently at the defect than when directed to normal glass. This difference in light action can be observed to identify the defect. One technique that has been developed is to take the light from a light source and then first direct the light through a diffusion plate to diffuse the light and then pass the diffused light through a slant slit-plate which splits the light into dark and light stripes. Cited U.S. Patent No. 5,004,909 (Fukuchi), discloses such a design in Figures 1 and 2 presented below. In Figure 1, 10 is the light source, 10a is the diffuser plate and 10b is the slant slit-plate. Figure 2 shows the slant slit-plate.

U.S. Patent Apr. 3, 1991 Sheet 3 of 9 5,004,909



A variation of this approach is to use a filter plate 50a shown in Figure 4A of U.S. Patent No. 4,601,395 (Juvinal) presented below.



The present invention does not follow this well-defined path. The inventor herein instead uses the light source itself to create the striping. The light source 16 defines a large area of light with a large number of vertical rows of L.E.D.s 18 (page 2, line 23). Individual timers 20 are connected to each vertical row of L.E.D.'s 18 so that when the rows are turned on, the timers will time out at selected times (0T, .2T, .4T, .6T, and .8T) of an imaging cycle (the time T required for the row of L.E.D.'s to turn fully on and appear white) with light intensity being a function of the time on (page 2, line 31).

#### (6) Issues

1. Is claim 1 novel over Juvinal;
2. Are claims 2-7 patentable over Juvinal;

3. Is the rejection of claims 1-7 under Section 112 proper.

(7) Grouping Of The Claims

This application only has one independent claim and all dependent claims relate to claim 1.

(8) Argument

1. Is claim 1 novel over Juvinal?

The examiner has rejected the claim 1 as anticipated by Juvinal. Juvinal discloses a light source that has a single brightness level. It is shown as a single light bulb. It is accordingly impossible for the Juvinal light source to anticipate claim 1. Claim 1 clearly provides that it is the illumination area of the light source that has a variety of intensities. Claim 1 provides for

"a light source, having an illumination area,..."

Claim 1 also provides for

"means for defining on said illumination area light intensities varying between a minimum brightness level that will permit the identification of a light blocking defect and a maximum brightness level,..."

As shown in Figure 2 of Juvinal presented above, Juvinal uses a single conventional light bulb. It has a single

intensity. Intensity levels varying between a minimum brightness level and a maximum brightness level can not be defined on that light source. Juvinall accordingly does not teach the claimed invention and the Examiner's rejection under section 102 is in error and should be reversed.

2. Are claims 2-7 patentable over Juvinall.

The prior art teaches the use of filter plate and strip plates in front of the light source to define the desired stripping. Juvinall does not teach that the light source can be manipulated to achieve these results. Juvinall teaches the use of a single light bulb. How than can claims 2-7 be obvious over Juvinall.

Claim 2 defines the light source as a plurality of rows of L.E.D.s. which per claim 1 define light source areas having different intensity levels. Juvinall teaches a single light bulb -The obvious conversion would be to an L.E.D. light source having a uniform intensity.

Claims 3-7 all define the L.E.D. source as having a variety of light intensities. Again Juvinall teaches a single light bulb.

Clearly the Examiner's rejection of claims 2-7 as obvious over Juvinall should be reversed.

3. Is the rejection of claims 1-7 under Section 112 proper.

The Examiner has rejected the claims under section 112 for the following reasons:

1. "Regarding claim 1, lines 13-14, it is unclear in its given context how a "rate of change... would be identified as a defect"?

2. "Furthermore, in lines 15-18, it is unclear how comparing neighboring pixels can exhibit a 'rate of change in brightness level.' Comparing neighboring pixels simply shows a difference or similarity in the shade or color of the pixels, not a 'rate of change'. The term 'rate of change' implies the brightness changing over time, however, simple comparison between neighboring pixels lacks the time element required for the use of the term 'rate of change.' Thus, it is unclear what applicant intends to claim."

When a defect is present light will strike the defect (a bubble, for example) and will be refracted or reflected differently than light passing through a perfect wall portion. The bubble could in effect appear black because all light hitting the bubble is directed away from its initial direction toward the camera. There is a change of intensity as the camera scans across an edge between two intensity levels. If three horizontal pixels are reviewed moving horizontally across a scan line they could go from three white, to two white and one 80% white, to one white and two 80% white, to three 80% white. This would indicate a rate of change due to the transition in intensity. If the bubble is detected the transition might go from three white to two white to black, to one white to two black to three black. This would be a rate of change in intensity higher than transitioning across an intensity change and would be seen as a fault.

The language of claim is clear.

3. "It is unclear if 'a light blocking defect' and a 'defect' refer to the same defect." The specification describes light blocking defects and refractive defects (page 5, line 8) and light blocking defect is a specific defect and defect is generic to all the defects. The language appears to be clear.

The examiner's rejection under section 112 should accordingly be reversed.

Respectfully submitted.

By

  
Spencer T. Smith  
Attorney for Applicants  
Reg. No. 25,926

September 28, 2001  
Emhart Glass Manufacturing Inc.  
89 Phoenix Avenue  
P.O.Box 1229  
Enfield, Connecticut 06083-1229  
(860) 814-4052  
(860) 81404173 (fax)

**CLAIMS**

1. A machine for inspecting the wall of a bottle comprising a conveyor for supporting a bottle at an inspection station,  
the inspection station including  
    a CCD camera on one side of the conveyor having a camera image,  
    a light source, having an illumination area, on the other side of the conveyor, for imaging the bottle on said CCD camera image,  
    means for defining on said illumination area light intensities varying between a minimum brightness level that will permit the identification of a light blocking defect and a maximum brightness level, the brightness level varying spatially, cyclically, and continuously at a rate of change which is less than a rate of change that would be identified as a defect,  
    computer means for analyzing said camera image by comparing neighboring pixels to determine the rate of change in brightness level to identify defects where the rate of change exceeds a defined value.
2. A machine for inspecting the wall of a bottle according to claim 1, wherein said light source comprises a plurality of L.E.D. rows.
3. A machine for inspecting the wall of a bottle according to claim 2, wherein said plurality of L.E.D. rows define a plurality of row groups each including a row having a maximum brightness level, a row having a minimum brightness level, at least one row intermediate said row having said maximum brightness level and said row having said minimum brightness level having a brightness level between said minimum brightness level and said maximum brightness level, and at least one row

on the side of the row having the minimum brightness level remote from said row having the maximum brightness level having a brightness level between the minimum brightness level and the maximum brightness level.

4. A machine for inspecting the profile and wall of a bottle according to claim 3, wherein there are a plurality of vertical L.E.D. rows intermediate the row having the minimum brightness level and the row having the maximum brightness level and the brightness level of said plurality of intermediate rows uniformly reduces from the row having the maximum brightness level to the row having the minimum brightness level.

5. A machine for inspecting the profile and wall of a bottle according to claim 4, wherein there are a plurality of vertical L.E.D. rows on the side of said row having the minimum brightness level remote from said row having the maximum brightness level and the brightness level of said plurality of said rows on the side of said row having the minimum brightness level remote from said row having the maximum brightness level uniformly increasing in brightness level proceeding away from the row having the minimum brightness level.

6. A machine for inspecting the profile and wall of a bottle according to claim 5, wherein the row having the minimum brightness level has a brightness level of about 20% of the maximum brightness level and wherein each of said vertical L.E.D. row groups has three vertical rows intermediate the row having the minimum brightness level and the row having the maximum brightness level, with the row adjacent the row having the minimum brightness level having a brightness level of about 40% of the maximum brightness level and the row adjacent the row having the maximum brightness level having a brightness level of about 80% of the maximum brightness level and the intermediate of the three vertical rows intermediate the row

having the minimum brightness level and the row having the maximum brightness level having a brightness level of about 60% of the maximum brightness level.

7. A machine for inspecting the profile and wall of a bottle according to claim 6, wherein each of said vertical L.E.D. row groups has three vertical rows on the side of the row having the minimum brightness level remote from the row having the maximum brightness level, with the row adjacent the row having the minimum brightness level remote from the row having the maximum brightness level having a brightness level of about 40% of the maximum brightness level and the next of the three vertical rows on the side of the row having the minimum brightness level remote from the row having the maximum brightness level having a brightness level of about 60% of the maximum brightness level and the last of the three vertical rows on the side of the row having the minimum brightness level remote from the row having the maximum brightness level having a brightness level of about 80% of the maximum brightness level.